

Application No.: 10/664,975
Examiner: S. L. Karls
Art Unit: 3723

AMENDMENT

Please amend the pending application in accordance with the following particulars.

In the Claims

The claims are amended as shown on the following pages under the heading LIST OF CURRENT CLAIMS. The list shows the status of all claims presently in the application and is intended to supersede all prior versions of the claims in the application. Any cancellation of claims is made without prejudice or disclaimer.

LIST OF CURRENT CLAIMS

Claim 1 (Currently Amended). An electric blower comprising:

an electric motor including a stator and a rotor;
an impeller being rotated by the electric motor;
an air guide having a plurality of guide blades around the impeller; and
a casing enclosing the impeller and the air guide,

wherein the casing is provided with a number of exhaust openings through which a part of an air stream suctioned by the impeller is discharged, and a circumferential length of each of the exhaust openings is substantially identical to a circumferential distance between outer peripheral ends of adjacent guide blades, and

wherein bottom surfaces of outer peripheral end portions of volute chambers are located between lower edges and upper edges of the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades, and the air stream released from the impeller passes through the valve chambers to be exhausted from an outer periphery of the air guide.

Claim 2 (Withdrawn). An electric blower comprising:

an electric motor including a stator and a rotor;
an impeller being rotated by the electric motor;
an air guide having a plurality of guide blades around the impeller; and
a casing enclosing the impeller and the air guide,

wherein the casing is provided with a number of exhaust openings through which a portion of an air stream suctioned by the impeller is discharged, and a circumferential length of each of the exhaust openings is less than a circumferential distance between outer peripheral ends of adjacent guide blades.

Claim 3 (Withdrawn). An electric blower comprising:

an electric motor including a stator and a rotor;
an impeller being rotated by the electric motor;
an air guide having a plurality of guide blades around the impeller; and
a casing enclosing the impeller and the air guide,

wherein the casing is provided with a number of exhaust openings through which a part of an air stream suctioned by the impeller is discharged, and a circumferential length of each of the exhaust openings is greater than a circumferential distance between outer peripheral ends of adjacent guide blades.

Claim 4 (Canceled).

Claim 5 (Currently Amended). The electric blower of claim 1, wherein outer peripheral end portions of the volute chambers are misaligned with the exhaust openings, ~~each of the volute chambers being an air passageway formed by two neighboring guide blades.~~

Claim 6 (Currently Amended). The electric blower of claim 1, wherein a total area S1 of the exhaust openings is less than a total cross sectional area S2 of outer peripheral end portions of the volute chambers.

Claim 7 (Withdrawn). The electric blower of claim 1, wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S2 of outer peripheral end portions of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 8 (Original). The electric blower of claim 1, wherein a total area S1 of the exhaust openings is less than a total cross sectional area S3 of an air path between the air guide and the casing.

Claim 9 (Withdrawn). The electric blower of claim 1, wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S3 of an air path between the air guide and the casing.

Claim 10 (Original). The electric blower of claim 1, further comprising a bracket enclosing the electric motor, and wherein a total area S1 of the exhaust openings is less than a total cross sectional area S4 of an air path between the electric motor and the bracket.

Claim 11 (Withdrawn). The electric blower of claim 1, further comprising a bracket enclosing the electric motor, and wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S4 of an air path between the electric motor and the bracket.

Claim 12 (Original). The electric blower of claim 1, further comprising a bracket enclosing the electric motor, the bracket having at least one outlet opening through which air supplied therein from the impeller is discharged outside.

Claim 13 (Original). The electric blower of claim 12, wherein a total area S1 of the exhaust openings is less than a total area S5 of the outlet opening.

Claim 14 (Withdrawn). The electric blower of claim 12, wherein a total area S1 of the exhaust openings is equal to or greater than a total area S5 of the outlet opening.

Claim 15 (Original). The electric blower of claim 12, wherein a total area S1 of the exhaust openings, a total cross sectional area S3 of an air path between the air guide and the casing, and a total area S5 of the outlet opening satisfy the following relationship: $S1 \leq S3 \leq S5$.

Claim 16 (Original). The electric blower of claim 12, wherein a total area S1 of the exhaust openings, a total cross sectional area S3 of an air path between the air guide and the casing, a total area S4 of an air path between the electric motor and the bracket, and a total area S5 of the outlet opening satisfy the following relationship: $S1 \leq S3 \leq S4 \leq S5$.

Claim 17 (Original). The electric blower of claim 1, wherein a total area S1 of the exhaust openings is set to be 40 mm^2 or greater.

Claim 18 (Original). The electric blower of claim 1, wherein there is provided a gap between an outer periphery of the air guide and an inner periphery of the casing.

Claim 19 (Original). The electric blower of claim 1, wherein each of the guide blades is located at about a center of a circumferential width of an exhaust opening.

Claim 20 (Original). The electric blower of claim 1, wherein ribs are provided on an outer surface of the casing above the respective exhaust openings.

Claim 21 (Withdrawn). The electric blower of claim 1, wherein side edges of each of the exhaust openings are inclined at an angle substantially identical to that of bottom surfaces of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 22 (Withdrawn). The electric blower of claim 1, wherein a side edge of each of the exhaust openings is inclined with respect to a longitudinal direction of a rotation shaft of the electric motor.

Claim 23 (Currently Amended). The electric blower of claim 1, wherein the number of the volute chambers is the same as that of the exhaust openings.

Claim 24 (Original). The electric blower of claim 1, wherein each of the exhaust openings is generally of a quadrilateral shape, and a side edge of each of the exhaust openings is inclined with respect to a longitudinal direction of a rotation shaft of the electric motor.

Claim 25 (Withdrawn). An electric blower comprising:

a stator and a rotor;

an impeller fixedly installed on a rotation shaft of the rotor;

a casing enclosing the impeller,

wherein the casing is provided with a plurality of exhaust openings through which a part of an air stream suctioned by the impeller is discharged, each of the

exhaust openings being in a form of a hole.

Claim 26 (Currently Amended). The electric blower of claim 1, further comprising a motor cover ~~covering~~ surrounding the casing, wherein the motor cover covers the exhaust openings, the motor cover being open at a downstream side of the part of the air stream.

Claim 27 (Withdrawn). A vacuum cleaner comprising:

a main body incorporating therein a suction inlet for suctioning dust and an electric blower for generating an air suction stream;

an outlet through which air discharged from the electric blower is exhausted outside;

a control unit for controlling an operation of the electric blower,

wherein the electric blower including an impeller for generating the air suction stream by the rotation thereof, a casing enclosing the impeller, and exhaust openings formed in the casing through which a part of an air stream suctioned by the impeller is discharged; and the control unit is disposed on an air path between the exhaust openings and the outlet.

Claim 28 (Withdrawn). The vacuum cleaner of claim 27, wherein one or more outlet openings are formed in a bracket disposed at a downstream side of the impeller of the electric blower, the bracket constituting the casing of the electric blower.

Claim 29 (Withdrawn). The vacuum cleaner of claim 27, wherein the control unit is retained by a cover enclosing the control unit on the air path.

Claim 30 (Withdrawn). The vacuum cleaner of claim 29, wherein the cover is provided with at least one air inlet through which an air flow discharged from at least one exhaust opening is introduced into the cover.

Claim 31 (Withdrawn). The vacuum cleaner of claim 30, wherein the cover is provided with two or more air inlets and the air flow discharged from at least one exhaust opening and that from at least one outlet opening are introduced into the cover via different air inlets.

Claim 32 (Withdrawn). The vacuum cleaner of claim 30, wherein the cover is provided with an air outlet through which an air stream introduced into the cover is discharged outside after passing through the control unit.

Claim 33 (Withdrawn). The vacuum cleaner of claim 30, wherein a heat generating element of the control unit is disposed in the vicinity of the air inlet of the cover.

Claim 34 (Withdrawn). The vacuum cleaner of claim 30, wherein further comprising a guide for guiding an air path between the exhaust openings and the air inlet of the cover.

Claim 35 (Withdrawn). The electric blower of claim 2, wherein bottom surfaces of outer peripheral end portions of volute chambers are located at a substantially identical level to those of lower edges of the exhaust openings or located between the lower edges and upper edges of the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 36 (Withdrawn). The electric blower of claim 3, wherein bottom surfaces of outer peripheral end portions of volute chambers are located at a substantially identical level to those of lower edges of the exhaust openings or located between the lower edges and upper edges of the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 37 (Withdrawn). The electric blower of claim 2, herein outer peripheral end portions of volute chambers are misaligned with the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 38 (Withdrawn). The electric blower of claim 3, herein outer peripheral end portions of volute chambers are misaligned with the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 39 (Withdrawn). The electric blower of claim 2, wherein a total area S1 of the exhaust openings is less than a total cross sectional area S2 of outer peripheral end portions of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 40 (Withdrawn). The electric blower of claim 3, wherein a total area S1 of the exhaust openings is less than a total cross sectional area S2 of outer peripheral end portions of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 41 (Withdrawn). The electric blower of claim 2, wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S2 of outer peripheral end portions of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 42 (Withdrawn). The electric blower of claim 3, wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S2 of outer peripheral end portions of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 43 (Withdrawn). The electric blower of claim 2, wherein a total area S1 of the exhaust openings is less than a total cross sectional area S3 of an air path between the air guide and the casing.

Claim 44 (Withdrawn). The electric blower of claim 3, wherein a total area S1 of the exhaust openings is less than a total cross sectional area S3 of an air path between the air guide and the casing.

Claim 45 (Withdrawn). The electric blower of claim 2, wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S3 of an air path between the air guide and the casing.

Claim 46 (Withdrawn). The electric blower of claim 3, wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S3 of an air path between the air guide and the casing.

Claim 47 (Withdrawn). The electric blower of claim 2, further comprising a bracket enclosing the electric motor, and wherein a total area S1 of the exhaust openings is less than a total cross sectional area S4 of an air path between the electric motor and the bracket.

Claim 48 (Withdrawn). The electric blower of claim 3, further comprising a bracket enclosing the electric motor, and wherein a total area S1 of the exhaust openings is less than a total cross sectional area S4 of an air path between the electric motor and the bracket.

Claim 49 (Withdrawn). The electric blower of claim 2, further comprising a bracket enclosing the electric motor, and wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S4 of an air path between the electric motor and the bracket.

Claim 50 (Withdrawn). The electric blower of claim 3, further comprising a bracket enclosing the electric motor, and wherein a total area S1 of the exhaust openings is equal to or greater than a total cross sectional area S4 of an air path between the electric motor and the bracket.

Claim 51 (Withdrawn). The electric blower of claim 2, further comprising a bracket enclosing the electric motor, the bracket having at least one outlet opening through which air supplied therein from the impeller is discharged outside.

Claim 52 (Withdrawn). The electric blower of claim 3, further comprising a bracket enclosing the electric motor, the bracket having at least one outlet opening

through which air supplied therein from the impeller is discharged outside.

Claim 53 (Withdrawn). The electric blower of claim 2, wherein a total area S_1 of the exhaust openings is set to be 40 mm^2 or greater.

Claim 54 (Withdrawn). The electric blower of claim 3, wherein a total area S_1 of the exhaust openings is set to be 40 mm^2 or greater.

Claim 55 (Withdrawn). The electric blower of claim 2, wherein there is provided a gap between an outer periphery of the air guide and an inner periphery of the casing.

Claim 56 (Withdrawn). The electric blower of claim 3, wherein there is provided a gap between an outer periphery of the air guide and an inner periphery of the casing.

Claim 57 (Withdrawn). The electric blower of claim 2, wherein each of the guide blades is located at about a center of a circumferential width of an exhaust opening.

Claim 58 (Withdrawn). The electric blower of claim 3, wherein each of the guide blades is located at about a center of a circumferential width of an exhaust opening.

Claim 59 (Withdrawn). The electric blower of claim 2, wherein ribs are provided on an outer surface of the casing above the respective exhaust openings.

Claim 60 (Withdrawn). The electric blower of claim 3, wherein ribs are provided on an outer surface of the casing above the respective exhaust openings.

Claim 61 (Withdrawn). The electric blower of claim 2, wherein side edges of each of the exhaust openings are inclined at an angle substantially identical to that of bottom surfaces of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 62 (Withdrawn). The electric blower of claim 3, wherein side edges of each of the exhaust openings are inclined at an angle substantially identical to that of bottom surfaces of volute chambers, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 63 (Withdrawn). The electric blower of claim 2, wherein a side edge of each of the exhaust openings is inclined with respect to a longitudinal direction of a rotation shaft of the electric motor.

Claim 64 (Withdrawn). The electric blower of claim 3, wherein a side edge of each of the exhaust openings is inclined with respect to a longitudinal direction of a rotation shaft of the electric motor.

Claim 65 (Withdrawn). The electric blower of claim 2, wherein the number of volute chambers is the same that of the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 66 (Withdrawn). The electric blower of claim 3, wherein the number of volute chambers is the same that of the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades.

Claim 67 (Withdrawn). The electric blower of claim 2, wherein each of the exhaust openings is generally of a quadrilateral shape, and a side edge of each of the exhaust openings is inclined with respect to a longitudinal direction of a rotation shaft of the electric motor.

Claim 68 (Withdrawn). The electric blower of claim 3, wherein each of the exhaust openings is generally of a quadrilateral shape, and a side edge of each of the exhaust openings is inclined with respect to a longitudinal direction of a rotation shaft of the electric motor.

Claim 69 (Withdrawn). The electric blower of claim 2, further comprising a motor cover covering the exhaust openings, the motor cover being open at a downstream side of the part of the air stream.

Claim 70 (Withdrawn). The electric blower of claim 3, further comprising a motor cover covering the exhaust openings, the motor cover being open at a downstream side of the part of the air stream.

Claim 71 (Withdrawn). The electric blower of claim 25, further comprising a motor cover covering the exhaust openings, the motor cover being open at a downstream side of the part of the air stream.

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Claim 72 (Withdrawn). The vacuum cleaner of claim 28, wherein the control unit is retained by a cover enclosing the control unit on the air path.

Claim 73 (Withdrawn). The electric blower of claim 1, wherein bottom surfaces of outer peripheral end portions of volute chambers are located at a substantially identical level to those of lower edges of the exhaust openings, each of the volute chambers being an air passageway formed by two neighboring guide blades.